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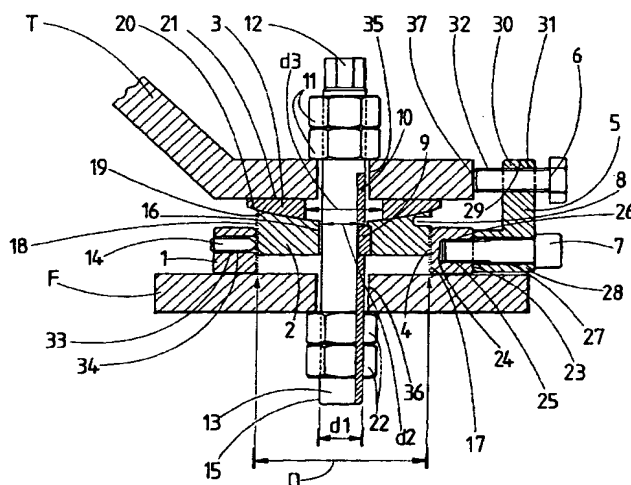
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(54) Title: **SETTING FOOT COMPRISING A BASE AND A CARRIER OF WHICH THE LEVEL CAN BE SET BY A LIFT MECHANISM WITH AT LEAST ONE SCREW THREAD**



(57) Abstract: Setting foot provided with a base and a carrier of which the level can be set with respect to the base by means of a lifting mechanism, in which the base is provided with an axial cylindrical opening having a diameter with internal screw thread, whereas the cylindrical carrier is provided with an external screw thread which cooperates with the internal screw thread of the carrier for the axial setting of the carrier, provided with a lifting mechanism, characterized in that, the coupling device comprises: - a setting bolt with an external screw thread and an outer diameter, and a coupling device between the setting bolt and the carrier; - a hollow (10) along a substantial part of the length of the setting bolt; - a coupling member between the hollow (10) and the setting bolt (13).

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Setting foot comprising a base and a carrier of which the level can be set by a lift mechanism with at least one screw thread

5       The invention relates to a setting foot comprising a base and a carrier of which the level can be set by a lift mechanism with at least one screw thread, in which the setting foot is provided with an axial cylindrical opening having a diameter with internal screw thread, 10       whereas the cylindrical carrier is provided with external screw thread which cooperates with the internal screw thread of the carrier for setting the carrier in axial direction.

      A setting foot of this type is known from FR 15       1.208.157, comprising a setting bolt with external screw thread and an outer diameter, a coupling device between the carrier and the setting bolt. The coupling device comprises hexagonal services on the setting foot which contact openings made in the external wall of the 20       carrier by which the carrier can be screwed up and down. This system is complicated, operates slowly and does not give an easy setting of the level of the carrier. Furthermore, with limited accessibility of the setting foot it is difficult to move the carrier up or 25       down by means of hook spanners.

      In shipping and industry, in which internal combustion engines are mounted, it is often a problem that the steel fillings have been pressed in the foundation. This pressing occurs because the bolts have 30       been vibrated loosely or are broken. This removes the clamping force of the setting bolt and the machine is

no longer fixedly mounted on the foundation. At most installations the foundation bolts by which the machines are anchored, are difficult to reach, for which reason this problem is rather important. When  
5 these fillings have been pressed in the machinery is placed radially lower with respect to the driven machinery, by which the driving shaft of the driven machine is seriously damaged.

The object of the inventions is removing these  
10 different objections. With regard to the setting of the level this object is reached according to the invention, in that the coupling device comprises:

- a hollow along a substantial part of the length of  
15 the setting bolt.

A preferred embodiment of the invention is characterized in that

20 - a coupling member between the hollow and the carrier which is fixedly mounted in the inner side of a smooth central opening having an internal diameter in the carrier;

25 - which wedge extends with an wide fitting into the wedge course into the setting bolt;

- in which the inner diameter of the central opening  
30 in the carrier is with a wide fitting larger than the outer diameter of the setting bolt.

A further embodiment of the invention is characterized in that

- 5       - the carrier is provided with a radial screw bore for a fixing screw bolt, of which the point extends into the hollow in the setting bolt;
- 10       - the wedge course in the setting bolt is open at the lower side for inserting the wedge from the upper side in an axial direction;
- 15       - the wedge course is closed at the upper side of the setting bolt.

As to the security against undesirable change of the level setting the object is reached with a setting foot comprising a base and a carrier, of which the level can  
20 be set with respect to the base by means of a lifting mechanism having at least one setting/mounting bolt, characterized in that, means are present for detecting the undesired change of the chosen setting of the mounting/setting bolt.

25       The invention will now further be elucidated referring to the accompanying drawing of some preferred embodiments.

Fig. 1 shows a cross section of a side view of a setting foot provided with a coupling device according  
30 to the invention in a partial axial cross section over the setting foot according to the invention.

Fig. 2 shows another embodiment of the coupling device having a radial screw bore in the carrier for a fixing screw bolt.

Fig. 3 shows in a same side view as fig. 1 a setting  
5 foot comprising an electrical security system with alarm when the setting changes undesirably.

According to fig. 1 the setting foot comprising a base 1, that can be placed on a foundation F. The base 1 has an axial cylindrical opening 4 having a diameter D  
10 with an internal screw thread 17. Furthermore, the cylindrical carrier 2 is provided with an external screw thread 8 which cooperates with the internal screw thread 17 of the carrier 2 for setting the carrier 2 in an axial direction.

15 This axial setting takes place by means of a lifting mechanism, which comprises:

- a setting bolt 13 with external screw tread 15 and an outer diameter  $d_1$ ;  
20
- a wedge hollow 10 along a substantial part of the length of the setting bolt 13;
- 25 - a wedge 9 which is fixedly mounted into the inner side of a smooth central opening 16 having an inner diameter  $d_2$  in the carrier 2, 3;
- 30 - said wedge 9 extends with a wide fitting into the wedge hollow 10 in the setting bolt 13;

- whereas the inner diameter  $d_2$  of the central opening 16 in the carrier is with a wide fitting larger than the outer diameter  $d_1$  of the setting bolt 13.

5

Furthermore,

- the carrier dish 2 has a concave upper end face 19;

10

- on which a bearing disk 13 rests with a convex bent lower surface 20 having the same radius of curvature as the concave upper end surface 19 of the carrier dish;

15

- the bearing disk 3 having a flat upper end face 21;

- 20 - the bearing disk 3 having a central opening with a diameter  $d_3$  which surrounds the setting bolt 13 having an outer diameter  $d_1$  with a wide play.

25 The wedge hollow 10 in the setting bolt 13 is open at the lower side for the axial insertion of the wedge 9 from the upper side. The wedge hollow 10 is closed at the upper end of the setting bolt 13. According to an efficient embodiment the setting bolt 13 is provided at its upper end with a hexagonal 12 for rotationally  
30 setting, by means of which the carrier disk 2 can be set into a vertical direction inside the base 1.

At a practical embodiment the setting bolt 13 is provided at the upper side with one or more security nuts 11 and the setting bolt 13 is provided at the lower side with one or more security nuts 22.

5     With this construction a fast vertical accurate setting of the rotating carrier is possible, in that when operating the external hexagonal 12 the wedge 9 drives the carrier 2. Fixation of the setting position takes place by means of the security nuts 11 and 22.

10     At a special embodiment of the setting foot according to the invention:

- 15     - the base 1 is provided in its vertical outer wall 23 with one or more horizontal, radial, blind borings 24, provided with internal screw thread 25,
- 20     - in these one or more blind borings 24 the screw thread part 26 of one or more horizontal fixing bolts 7 can be fastened,
- 25     - one or more rectangular setting clamps 5 in the horizontal leg 28 are provided with a smooth bore 27 for fixing bolts 7 which firstly extend with a large fitting through the smooth bore and are thereafter fastened in the base 1, by means of which these setting clamps are fastened at the outside of the base 1,

30

- the one or more setting clamps 5 in the vertical leg 29 have been provided near the upper side with a horizontal bore 30 with internal screw thread 31 for the screw thread 32 of a horizontal setting screw 6 for horizontally setting the base 1 with regard to the tool T to be set.

By the application of the setting clamps the position of the tool T can be set accurately in a horizontal direction with regard to the foot, which in its turn is withheld from rotation on the foundation F by means of a small weld (not shown) or another method against rotation.

In practice it is easy, when the base 1 is provided in its vertical outer wall 23 with one or more horizontal, radial, continuous bores 33, provided with internal screw thread 34 for one or more security and/or level indicating screws 14.

Notwithstanding the limited accessibility it may be useful in some cases, that the base 1 is provided in its outer wall 23 with one or more horizontal, radial hollows 8 for the level setting of the carrier 2 by means of spanners.

When using the setting foot according to the invention this is placed with its base 1 on a foundation F, in which the tool T to be set is placed on the bearing disk 3 of the setting foot 1, whereas the setting bolt 3 extends through two superimposed, aligned holes 35, 36 in the foundation F the tool T respectively, and a setting screw 6 is turned against the side wall 37 of the tool T to be set.



Fig. 3 shows the electrical security against undesired change of the setting of the setting foot, which is provided with a base 1 and a carrier 2, 3 of which the level can be set with regard to the base by means of a lifting mechanism, preferably that according to fig. 1. According to a preferred embodiment of the security there are means present for detecting the chosen setting of the mounting/setting bolt 13. These detection means comprise electrical sensors.

10      These electrical sensors comprise:

- 15      a)      a non-conducting, in cross section U-shaped, ring shaped, electrically isolating cover (58) which is connected in the middle of its horizontal bottom with the lower end of the setting/mounting bolt (13);
- 20      b) a number of electrically conductive contact rods (54) which are distributed around the circumference of the bottom lid (58) and can be set in a vertical direction in the side wall of the lid (58);
- 25      c) a number of electrically conductive contact plates (58) of which the number corresponds with the number of contact rods (54), of which contact plates the lower side connects with the upper side of the contact rods (54) for the formation of a disconnectable electrical connection;

30

d) the contact rods (54) are fastened by the nuts (56, 57) in the isolating lid (58), whereas between these nuts a contact ring (66) is placed for closing the electrical circuit.

5

Furthermore, the contact rods (54) are provided at the upper end with an open hollow or otherwise shaped, such as hexagonal hollow (62) for the rotating setting of the contact rod. Preferably the electrically  
10 conductive contact plates (51) are integrated in the bottom of a ring shaped isolator (52) which is in cross section inverted U-shaped, which isolator (52) is connected against the lower side of a foundation plate (F).

15 According to a preferred embodiment the contact plates (51) and the contact rods (54) are part of an electrical circuit (65), which is coupled with an alarm circuit.

The isolating lid (58) is provided in its side wall  
20 with a number of screw bores (54a) for the electrically conducting contact rods (5) with corresponding outer screw thread for setting in a vertical direction.

Furthermore, the ring shaped isolator (52) is provided at the outer side with an electrical  
25 connection (50), which is connected to the contact plates (51), which connection is adapted for making contact by means an operating member, such as a screw driver or hexagonal spanner.

The isolating lid (58) is provided with an external  
30 screw thread (63) for the mounting of a fluid tight protection member with cable throughput.

## Claims

1. Setting foot comprising a base (1) and a carrier (2, 3), of which the level with regard to the base (1) can be set by a lift mechanism with at least one screw thread, in which the base (1) is provided with an axial cylindrical opening (4) with a diameter (D) with internal screw thread (17), whereas the cylindrical carrier (2) is provided with external screw thread (8) which cooperates with the internal screw thread (17) of the carrier (2) for setting the carrier (2) in an axial direction, comprising a setting bolt (13) with external screw thread (15) and an outer diameter (d1), and a coupling device between the carrier (2) and the setting bolt (13), characterized in that:
- a hollow (10) extending over a substantial part of the length of the setting bolt (13).
2. Setting foot according to claim 1, characterized in that, the coupling device comprises
- a wedge (9) which is fixedly fastened in the inner side of a smooth central opening (16) having a inner diameter (d2) in the carrier (2, 3);
  - said wedge (9) extending with a loose fitting into the wedge hollow (10) in the setting bolt (13);
  - in which the inner diameter (d2) of the central opening (16) in the carrier is with a loose

fitting larger than the outer diameter (d1) of the setting bolt (13).

3. Setting foot according to one or more of claims 1  
5 through 2, characterized in that,
- a) the wedge hollow (10) in the setting bolt  
(13) is open at the lower side for inserting  
from above the wedge (9);
- 10 b) the wedge hollow (10) is closed at the upper  
side of the setting bolt (13).
4. Setting foot according to one or more of claims 1  
15 through 3, characterized in that, the carrier (2)  
is provided with a radial screw bore (70) for a  
fixing screw bolt (71) of which the point (72)  
extends into a short hollow (10) in the setting  
bolt (13) with closed ends.
- 20 5. Setting foot according to one or more of claims 1  
through 3, characterized in that, the setting bolt  
(13) is provided at the upper end with a hexagonal  
(12) for rotational setting, by means of which the  
carrier disk (2) is settable in a vertical  
25 direction in the base (1).
6. Setting foot according to one or more of the  
claims 1 through 5, characterized in that,
- 30 a) the base (1) is provided in its vertical  
outer wall (23) with one or more horizontal,

radial, blind bores (24), provided with internal screw thread;

- 5           b) in these one or more blind bores (24) the screw thread part (26) of one or more horizontal fastening bolts (7) can be fixed;
- c) one or more rectangular setting clamps (5) have been provided in the horizontal leg (28) with a smooth bore (27) for fastening bolts (7), which first extend through the smooth
- 10           bore with a loose fitting and are thereafter fixed in the base (1), by means of which these setting clamps (5) are fastened to the outside of the base (1);
- d) the one or more setting clamps (5) are
- 15           provided in the vertical leg (29) near the upper side with a horizontal bore (30) having internal screw thread (31) for the external screw thread (32) of a horizontal setting screw (6) for setting the tool (T) to be set
- 20           with regard to the base (1).

7.   Setting foot according to one or more of claims 1 through 6, characterized in that, the base (1) is provided in its vertical outer wall (23) with one

25   or more horizontal, radial, through going bores (33), provided with internal screw thread (34) for one or more security and/or level indicating screws (14).

30   8.   Setting foot according to one or more of claims 1 through 7, characterized in that, the base (1) has

been provided in its vertical outer wall (23) with one or more horizontal, radial, hollows (8) for setting the level of the carrier (2) by means of spanners.

5

9. Setting foot comprising a base (1) and a carrier (2, 3) which can be set in a vertical direction with regard to the base (1) by means of a lifting mechanism, characterized in that, means are present for the undesired change of the chosen setting of the mounting/setting bolt (13).
10. Setting foot according to claim 9, characterized in that, the detection means comprise electrical sensors.
11. Setting foot according to claim 9 or 10, characterized in that, the electrical sensors comprise:
  - a) a ring shaped, electrically isolating lid (58) having an inverted U shaped cross section, which is mounted in the middle of its horizontal bottom to the lower end of the setting/mounting bolt (13);
  - b) a number of electrically conductive contact rods (54) which are distributed around the circumference of the bottom wall of the lid (58) and are settable in a vertical direction (54a) in the side wall of the lid (58);

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- c) a number of electrical conductive contact plates (51) of which the number corresponds with the number of contact rods (54), against which contact plates (51) the upper ends  
5 contacts of the contact rods (54) for making a disconnectable electrical connection.
12. Setting foot according to claims 9 through 11, characterized in that, the electrically conductive  
10 guiding plates (51) are received into the bottom of a ring shaped isolator (52) of which the cross section is inverted U shaped, which isolator is fastened to the bottom side of a foundation plate (F).
- 15 13. Setting foot according to one or more of claims 9 through 12, characterized in that, the contact plates (51) and the contact rods (54) are part of an electrical circuit (65).
- 20 14. Setting foot according to one or more of the claims 9 through 13, characterized in that, the electrical circuit (65) is coupled with an alarm circuit.
- 25 15. Setting foot according to one or more of the claims 9 through 14, characterized in that, the isolating lid (59) is provided in its side wall with a number of screw bores (54a) for the  
30 vertical setting of electrically conductive

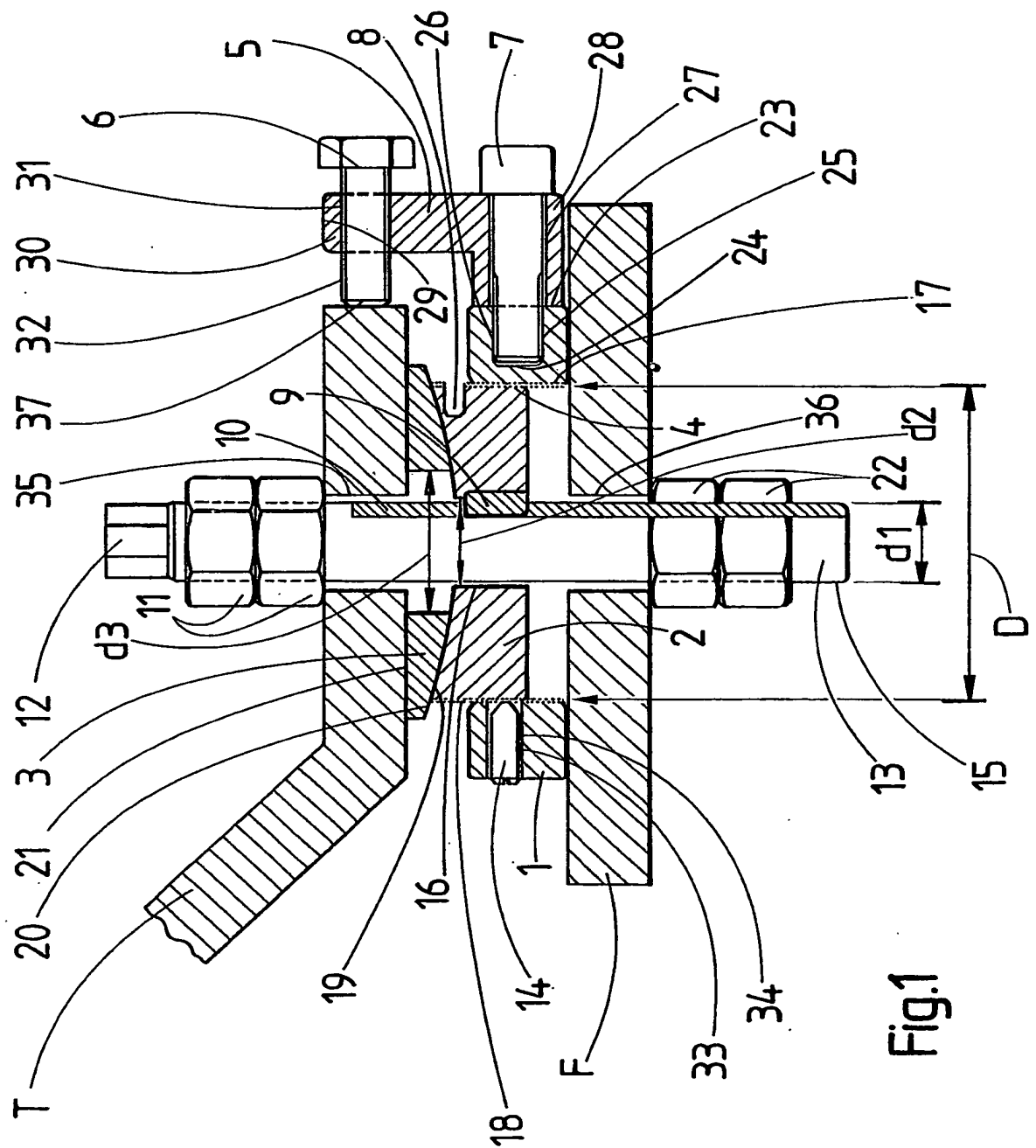
contact rods (54) having a corresponding external screw thread.

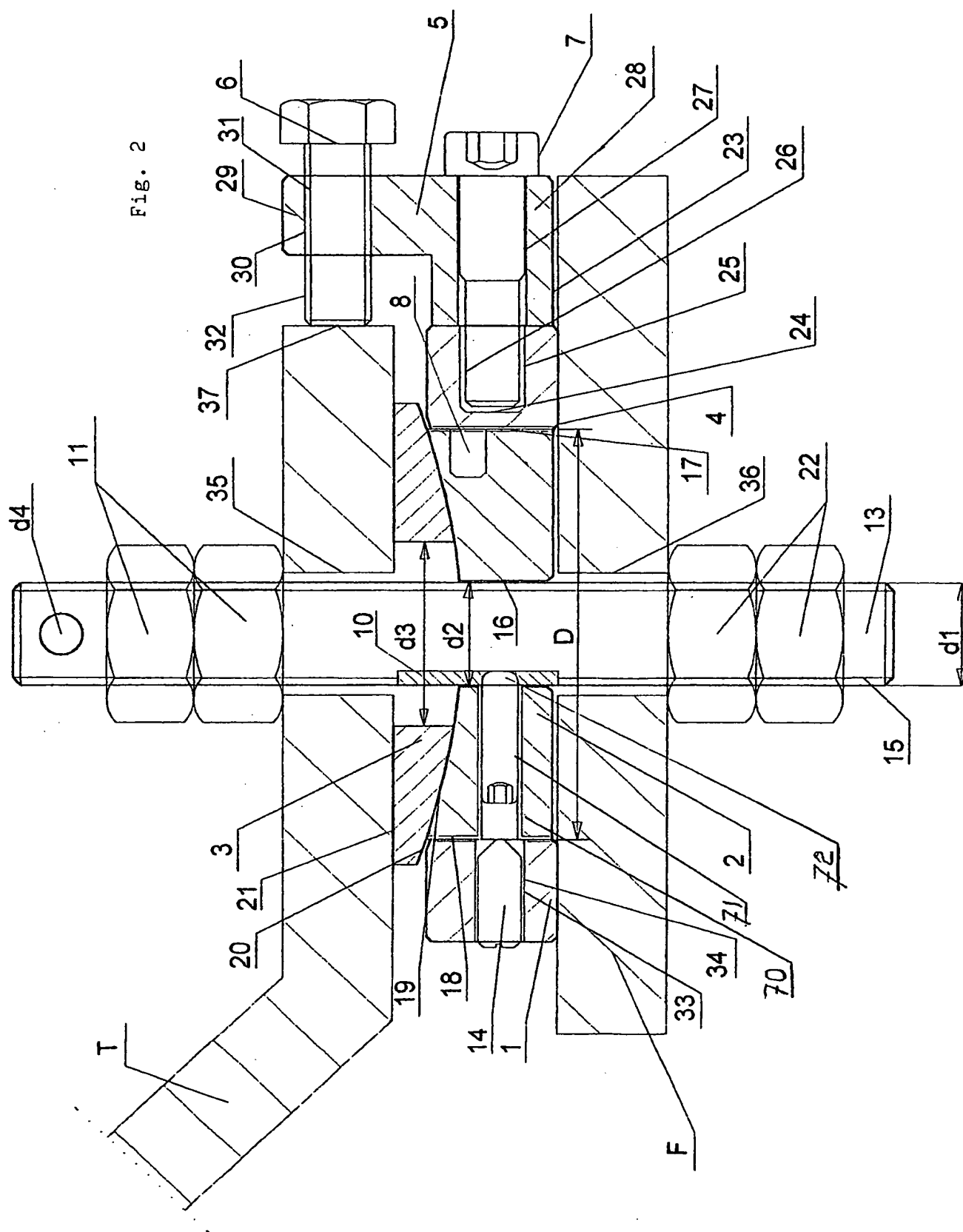
16. Setting foot according to one or more of claims 9  
5 through 15, characterized in that, the ring shaped  
isolator (52) is provided at the outer side with  
an electrical connection (50), which is connected  
to the contact plates (51), which connection is  
10 adapted for operation by means of an operating  
member, such as a screw driver or hexagonal  
spanner.
17. Setting foot according to one or more of claims 9  
15 through 16, characterized in that, the contact  
rods (54) with nuts (56, 57) are fastened in the  
isolating lid (58), whereas between these nuts a  
contact ring (66) is present for closing the  
electrical circuit.
- 20 18. Setting foot according to one or more of claims 9  
through 17, characterized in that, the contact  
rods (54) are provided at the outer side with an  
open hollow or differently shaped, such as  
hexagonal hollow (62) for the turning setting of  
25 the contact rod (54) by means of an operating  
member, such as a screw driver or hexagonal  
spanner.
19. Setting foot according to one or more of claims 9  
30 through 18, characterized in that, the isolating  
lid (58) is provided with a screw bore (61) for

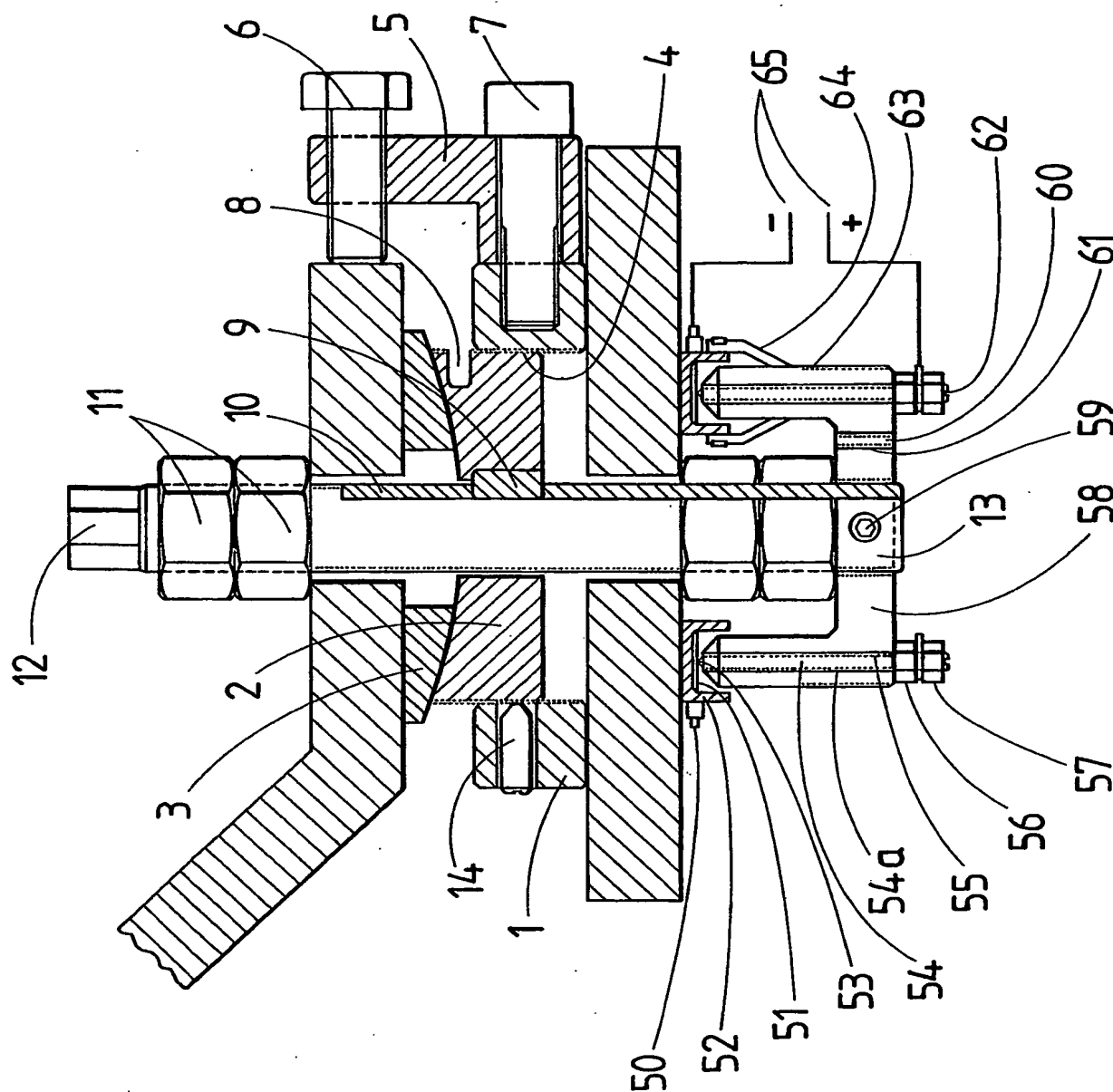


the removal of condensate or other liquid, which can be closed by a screw stopper (60).

20. Setting foot according to one or more of claims 9  
5 to 19, characterized in that, the isolating lid  
(58) is provided with an external screw thread  
(63) for screwing on a fluid tight protection cap  
(64) with cable throughput.







# INTERNATIONAL SEARCH REPORT

Application No  
PCT/NL 02/00679

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 F16M7/00

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 F16M F16D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

WPI Data, PAJ, EPO-Internal

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

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A	FR 1 208 157 A (BERTUCH HANS) 22 February 1960 (1960-02-22) cited in the application page 2, left-hand column, line 41 -right-hand column, line 35; figure 1	1,2,5
A	WO 97 35144 A (KEUS ELBERT CHRISTOFFEL EDWARD) 25 September 1997 (1997-09-25) page 3, line 36 -page 4, line 1; figure 1	1,7,8
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	-/-	

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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Date of the actual completion of the international search

18 February 2003

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## INTERNATIONAL SEARCH REPORT

Internal Application No  
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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

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